Green Infrastructure and Transportation
Introduction to Green Infrastructure Concepts and Principles

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Mission & Program Areas

"The Conservation Fund forges **partnerships** to conserve America's legacy of land and water resources."

"Through **land acquisition**, **sustainable programs**, and **leadership training**, the Fund and its partners demonstrate sustainable conservation solutions emphasizing the integration of economic and environmental goals."
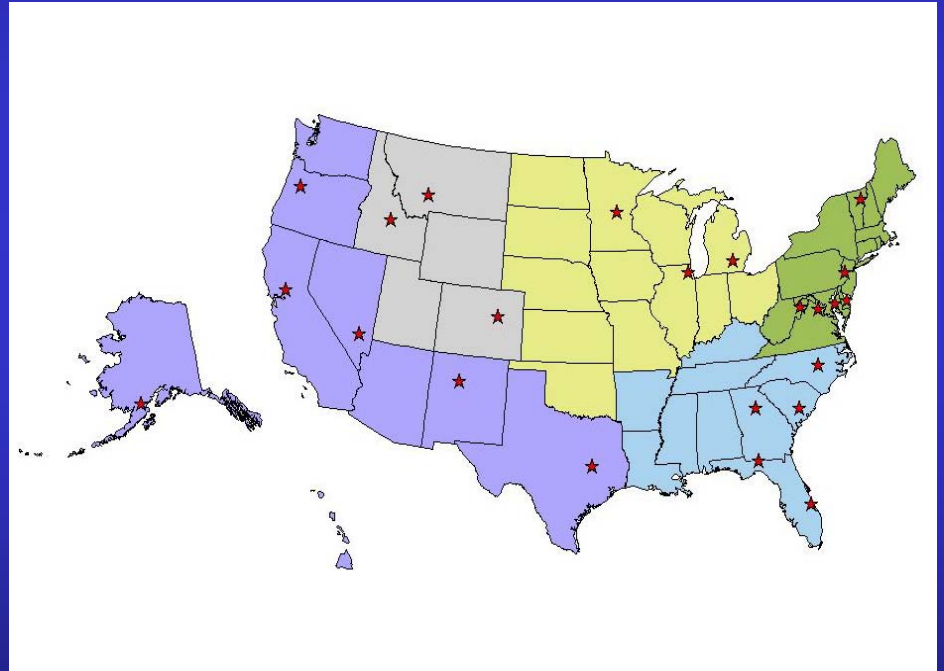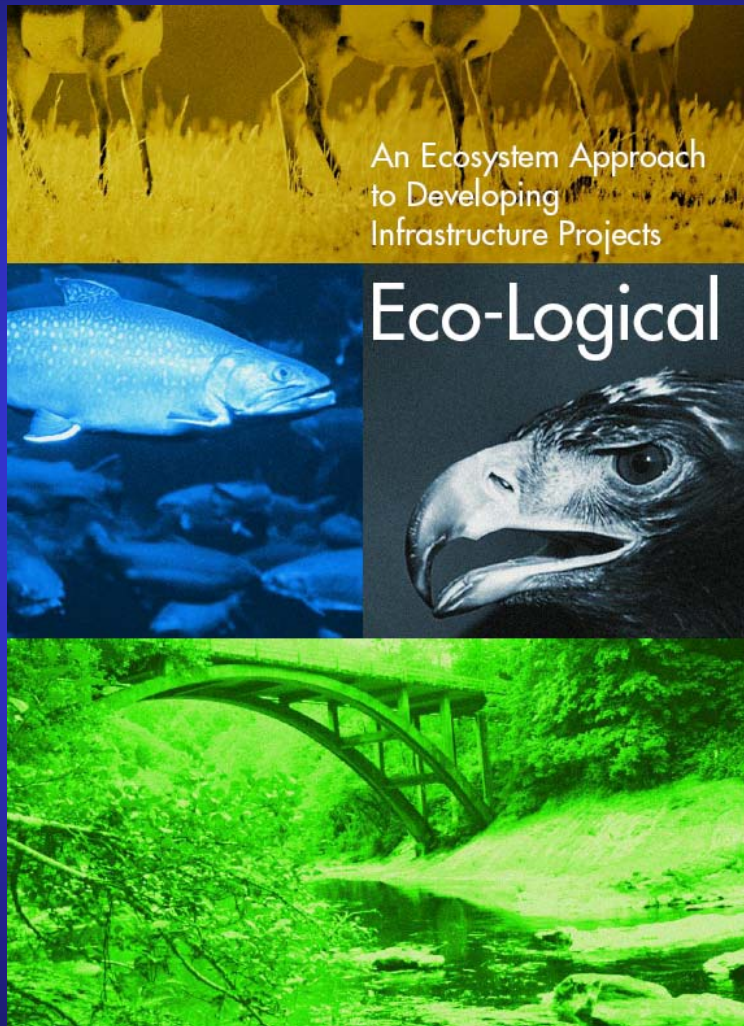
TCF Regional Offices
Staff: 130 Nationwide

- Alaska
- California
- Colorado
- Delaware
- Florida
- Georgia
- Idaho
- Illinois
- Maryland
- Michigan
- Minnesota
- Montana
- Nevada
- New Mexico
- North Carolina
- Oregon
- Pennsylvania
- South Carolina
- Texas
- Vermont
- West Virginia

An Ecosystem Approach to Developing Infrastructure Projects

Eco-Logical

USFWS

Dept of the Army

USEPA

US Forest Service

NPS

BLM

NMFS

FHWA

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Eco-Logical -- Green Infrastructure

"An Ecosystem Approach to Developing Infrastructure Projects"

- Goal Driven

- Collaboratively developed vision

- Integrates ecological, economic and social factors

- Geographic framework defined by ecological boundaries

- Transportation Benefits: ecosystem based mitigation = predictability, efficiency, cost-effectiveness

Green Infrastructure – What Is It?

"An interconnected network of natural lands and other open spaces that conserves ecosystem values and functions and provides associated benefits to human populations"

The Challenge of Growing Communities

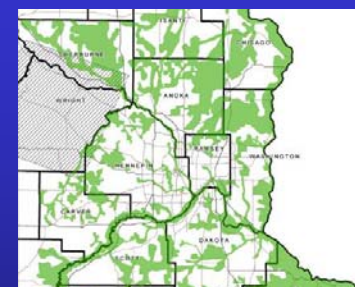## What's needed? Tools to be more strategic!

Which lands to conserve?

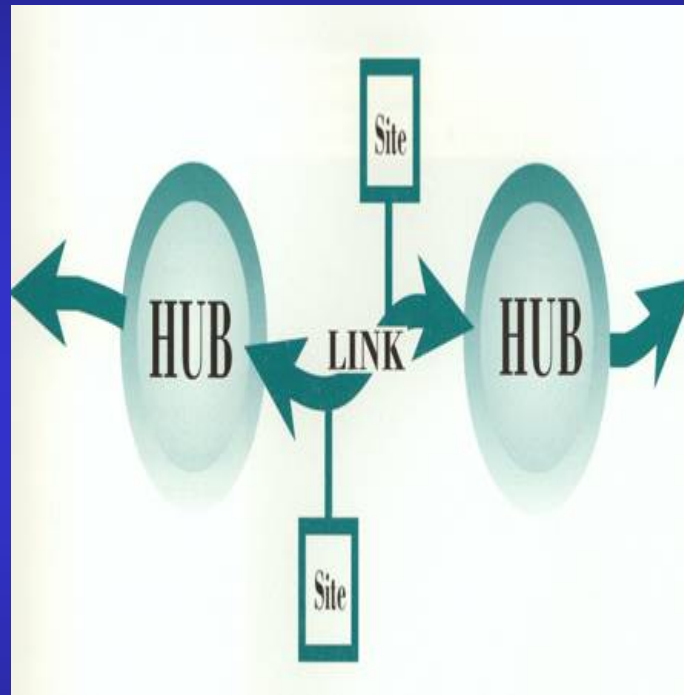**Where to construct roads & utilities?**

Where to permit development?

A framework to integrate & inform!

Green Infrastructure – What Is It?

- **Hubs** – anchor the system
- **Links** – tie the system together
- **Sites** – smaller areas, may not be attached

- **Lands** - public, private & non-profit
- **Scales** - statewide, regional & community
- **Landscapes** - Urban, suburban, rural & wild

Green Infrastructure – What Is It?

Green Infrastructure Network

Lands that Provide Associated Benefits for Human Populations

Lands that Support Natural Ecosystem Values and Functions
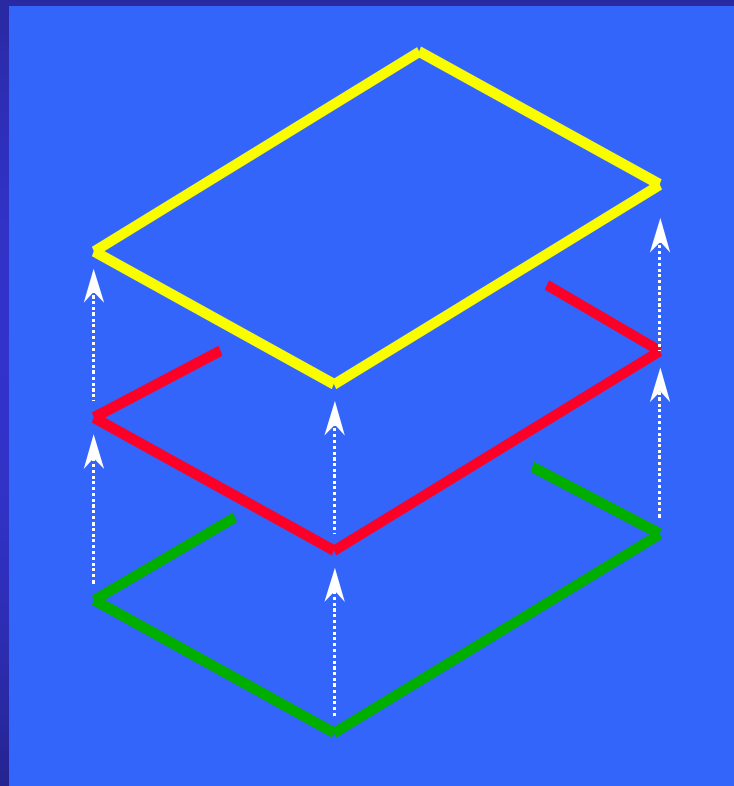
Green Infrastructure Approach

A science-base process that brings together:

- ✓ Natural resource, land planning and built/grey infrastructure professionals

- ✓ Elected and appointed officials

- ✓ The interested public

Relating Green to Gray

Green Infrastructure and Gray Infrastructure

Both Require:

➢ *Strategic planning* **to ensure optimal / functional systems**

➢ *Financing* **for design and maintenance**

➢ *Management* **to maintain services & maximize benefits**

Ideally Are:

➢ *Planned simultaneously* **before development**

➢ *Given equal priority* **in the planning process**

➢ **Planned as complimentary systems**

➢ *Given equal attention* **in the funding process**

What Green Infrastructure is Not!

- ✓ **A program**

- ✓ **A short-term solution**

- ✓ **An isolated effort**

- ✓ **No growth or anti-development**

- ✓ **"Green" engineered structures**

What Are the Origins of the Green Infrastructure Approach?

Two Guiding Concepts

❖ Protecting & linking parks and other green spaces for the benefit of people

❖ Preserving & linking natural areas to benefit biodiversity and counter habitat fragmentation

"At present, not one park is large enough to provide year-round sanctuary for adequate populations of all resident species. . . " *George Wright, 1932*

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What Are the Origins of the Green Infrastructure Approach?

American Greenways Movement

Why Plan & Protect Green Infrastructure?

Providing Ecosystem Services

Supporting Working Lands / Tourism

"Selling" Homes and Communities

Enhancing Quality of Life

Green Infrastructure

Sounds similar to the goals of….
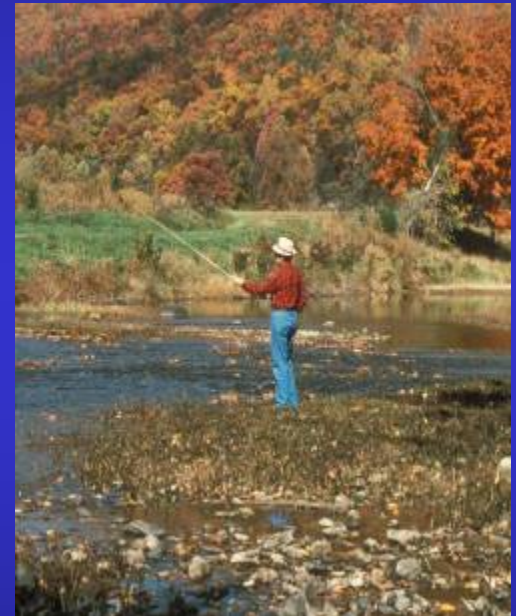
… Context Sensitive Solutions

Green Infrastructure - How?

Steps for Undertaking A Green Infrastructure Initiative In Your Community
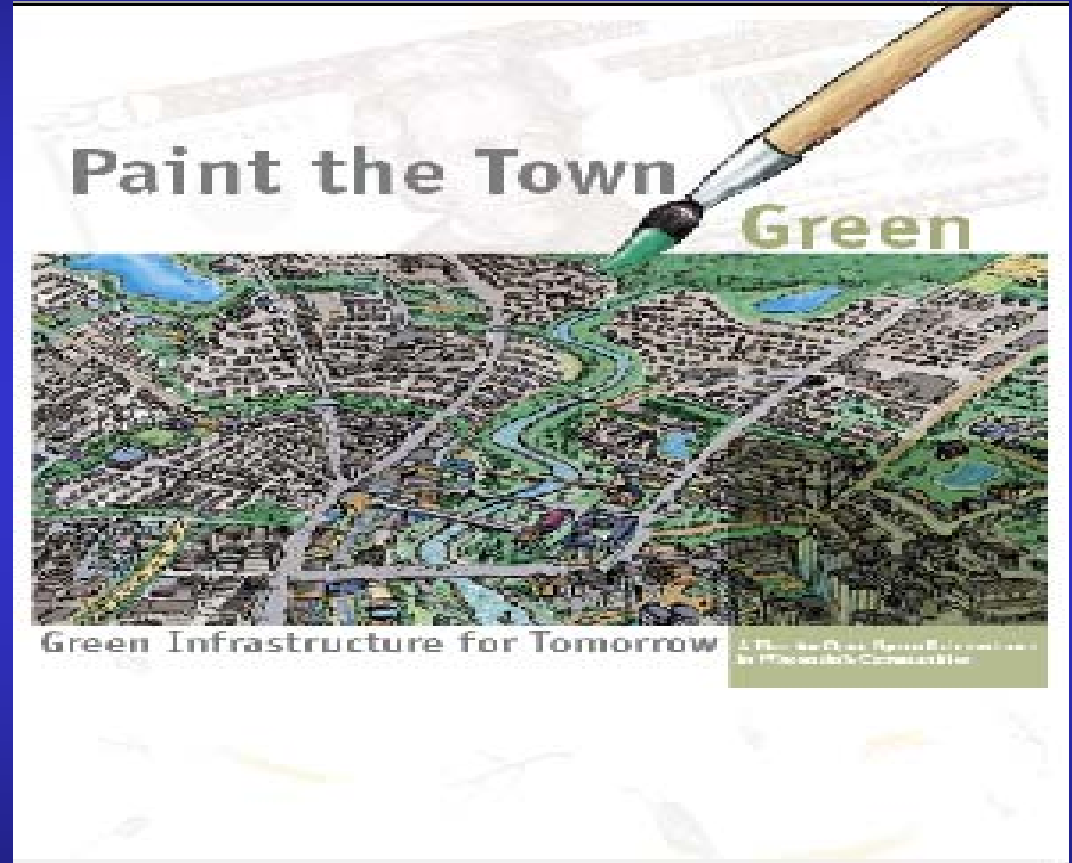
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Keys to Success

Create a Leadership Group to guide your green infrastructure initiative

Keys to Success

Design a green infrastructure network to link components across scales & political boundaries

Keys to Success

Green Infrastructure Network:

Identify desired network features and gather data that represents their spatial arrangement across the landscape

- ✓ **Natural Areas and Features**
- ✓ **Watersheds / Water Flow ways**
- ✓ **Wildlife / Wildlife Movement Corridors**
- ✓ **Nature-Based Trails and Parks**
- ✓ **Outdoor Education**
- ✓ **Cultural Resources**
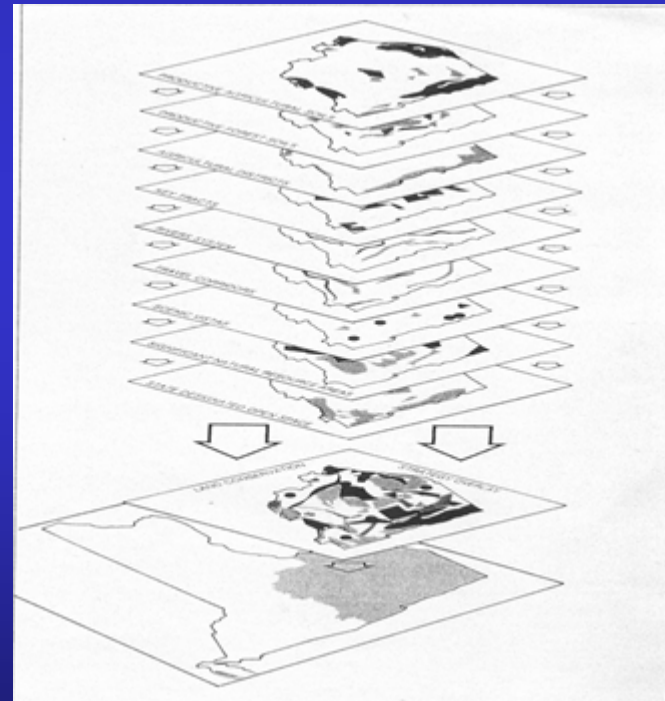
Keys to Success

Green Infrastructure Network:

Lay out the network to connect important green space elements across multiple landscapes, jurisdictions, and scales
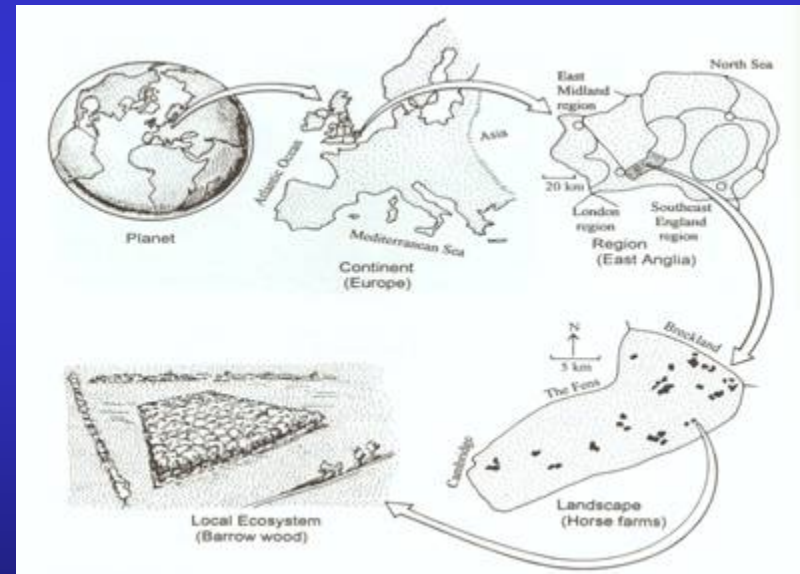
Keys to Success

Develop an "implementation quilt" to make your network design a reality
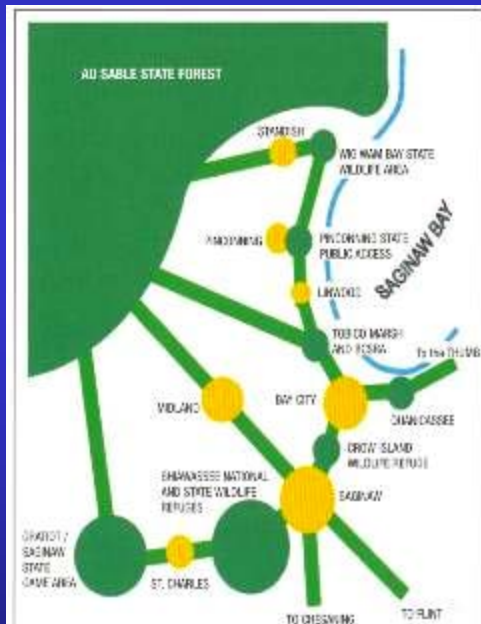
Keys to Success

Green Infrastructure Implementation Quilt:

Match financial, management and other identified tools to the different elements of your green infrastructure network

Historic Site

Conservation Development

Mitigation Bank

Fee Simple Acquisition

Conservation Easement

Floodplain Regulation

Park Site

Working Lands BMPs

A Regional Reserve Network: Core Areas and smaller reserves are connected by corridor habitat through which wildlife species can travel.

Core Area

Core Area

Core Area

Keys to Success

Green Infrastructure Implementation Quilt:
Identify the various people, programs and organizations that can act to implement the different elements of your network

	Government Agency	Private Landowner	Conservation Nonprofit / NGO	Business & Industry
Site Protection		🏫	🍂	🧑‍💼
Site Restoration	👤	🏫		
Site Management	👤		🍂	🧑‍💼

Identification and Evaluation of Natural Resource Environmental Stewardship Opportunities
Partners:

Conceptual Environmental Stewardship Process

October 2006

1. **Stewardship Team Meeting Workshop**
   Establish and confirm
   - Process
   - Roles
   - Responsibilities
   - Schedule

2. **IAWG ES Kick-off Workshop**
   Establish and confirm
   - Process
   - Roles
   - Responsibilities
   - Schedule

3. **Identify ES Needs (ES Team and IAWG)**
   Identify ES needs based on county policies and objectives and resource agency priorities

4. **Develop ES Process (ES Team and IAWG)**
   a. Reevaluate green infrastructure parameters
      i. reassess applicable target species/habitat
      ii. identify, define and incorporate additional parameters, as needed
      iii. finalize parameter ecological weighting factor
   b. Identify process for identifying community opportunities with Community Resource Work Group
   c. Assess existing data and identify data gaps and process for filling gaps
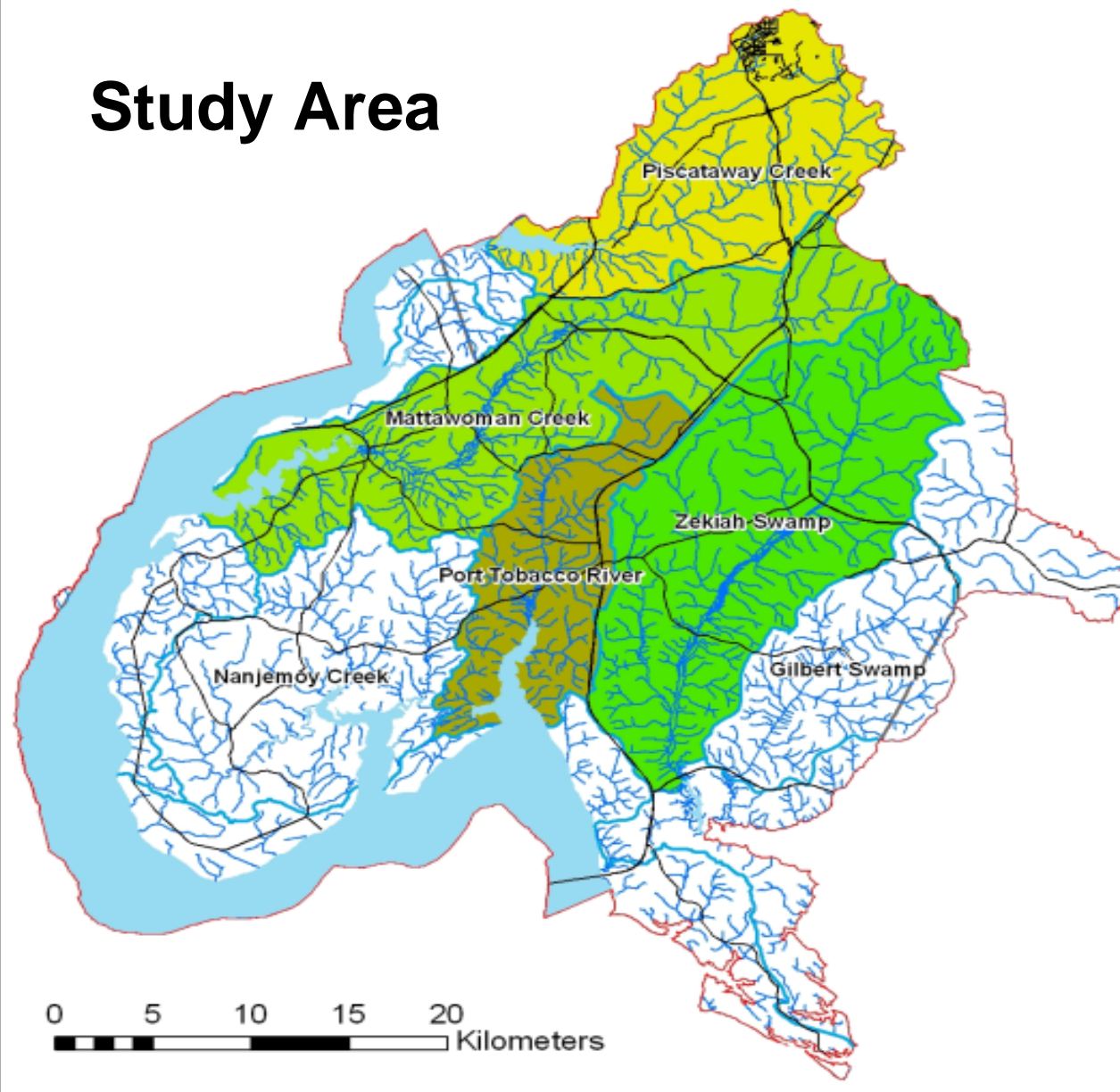   d. Update data gaps and baseline mapping
   e. Define technical assessment protocols to rank opportunities by broad groups

5. **Perform ES Opportunity Identification**

Natural Resources (Natural Resource Work Group with SHA oversight)
   a. Perform green infrastructure evaluation for US 301 Waldorf Area
   b. Identify strategic opportunities based on gaps, important corridors, etc.
   c. Categorize opportunities into broad groups tied to technical assessment protocols

Community Resources (Community Resource Work Group with SHA oversight)
   a. Identify potential community opportunities for US 301 Waldorf Area
   b. Categorize opportunities into broad groups tied to established protocols

Winter 2007

6. **Technical Assessment of ES Opportunities (ES Team with SHA oversight/assistance)**
   a. Perform field assessment of opportunities based on established protocols
   b. Rank opportunities based on scoring criteria

7. **Feasibility and Benefit/Cost Comparison of ES opportunities (SHA with IAWG oversight)**
   a. Develop conceptual approach for implementation (construction, management, preservation, technical assistance, etc.)
   b. Develop conceptual cost
   c. Compare costs with ranking score to determine overall benefit effectiveness

8. **Field View of ES Opportunities with IAWG**

9. **Prioritization of ES Opportunities (IAWG with SHA oversight)**
   a. Compare ES opportunities with ES needs
   b. Develop Prioritized list of recommended ES opportunities based on ES needs and benefit effectiveness

Summer 2008

Study Area

NiSource Green Infrastructure Project

- NiSource
  - Natural gas transmission company
  - Operation and maintenance activities impact endangered species
- US Fish and Wildlife Service (USFWS)
  - Enforce Endangered Species Act
  - Streamline project review while enhancing species protection

NiSource pipeline network
- 14 States
- 15,500 linear miles
- 6.4 million acres
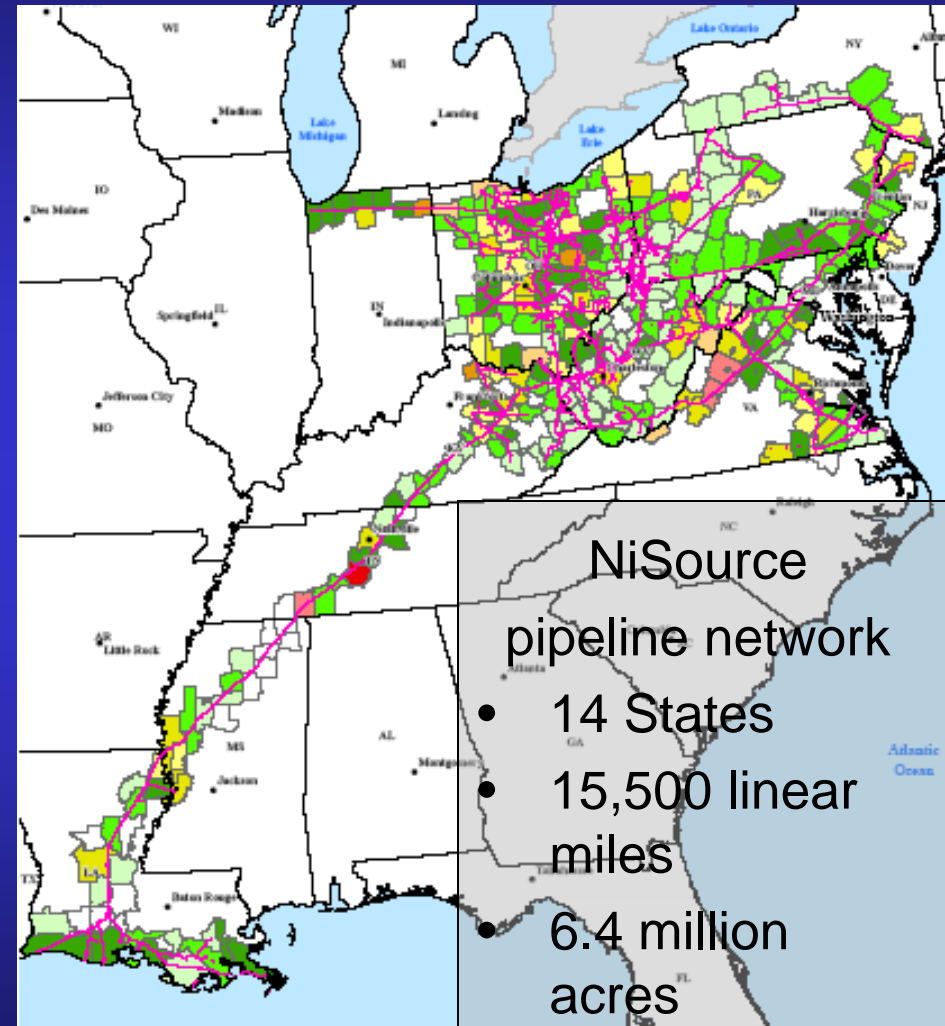
Project Components

- Assess endangered species impacts across the entire pipeline network over the long-term

- Develop Multiple Species Habitat Conservation Plan

- Utilize green infrastructure approach to implement strategic mitigation

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The Benefits of Taking a Green Infrastructure Approach to Land Planning

Benefits to Land Management Agencies

- Places land in context

- Provides a mechanism/incentive for planning beyond 'fence-line'

- Fosters partnerships

- Enhances visitor experience – leads to recognition of sense of place

Benefits to Regulatory Agencies

- Streamlines the review process

- Streamlines operating procedures

- Cheaper to protect than restore…

Benefits to Transportation

- GI Plans can inform Transportation Plans, and vice versa

- GI plans can help transportation planning organizations (State DOTs and MPOs) meet 6001 requirements

- GI Plans can save Transportation staff time and lead to more streamlined reviews

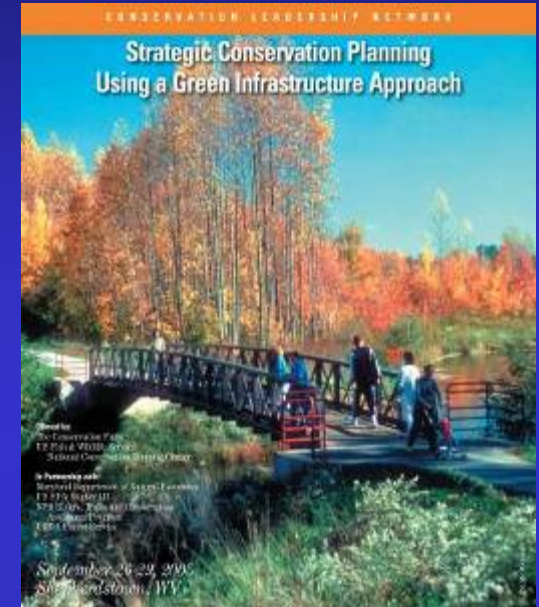- For Conservation interests – the focus is on how the 'grey' can further promote 'green' goals
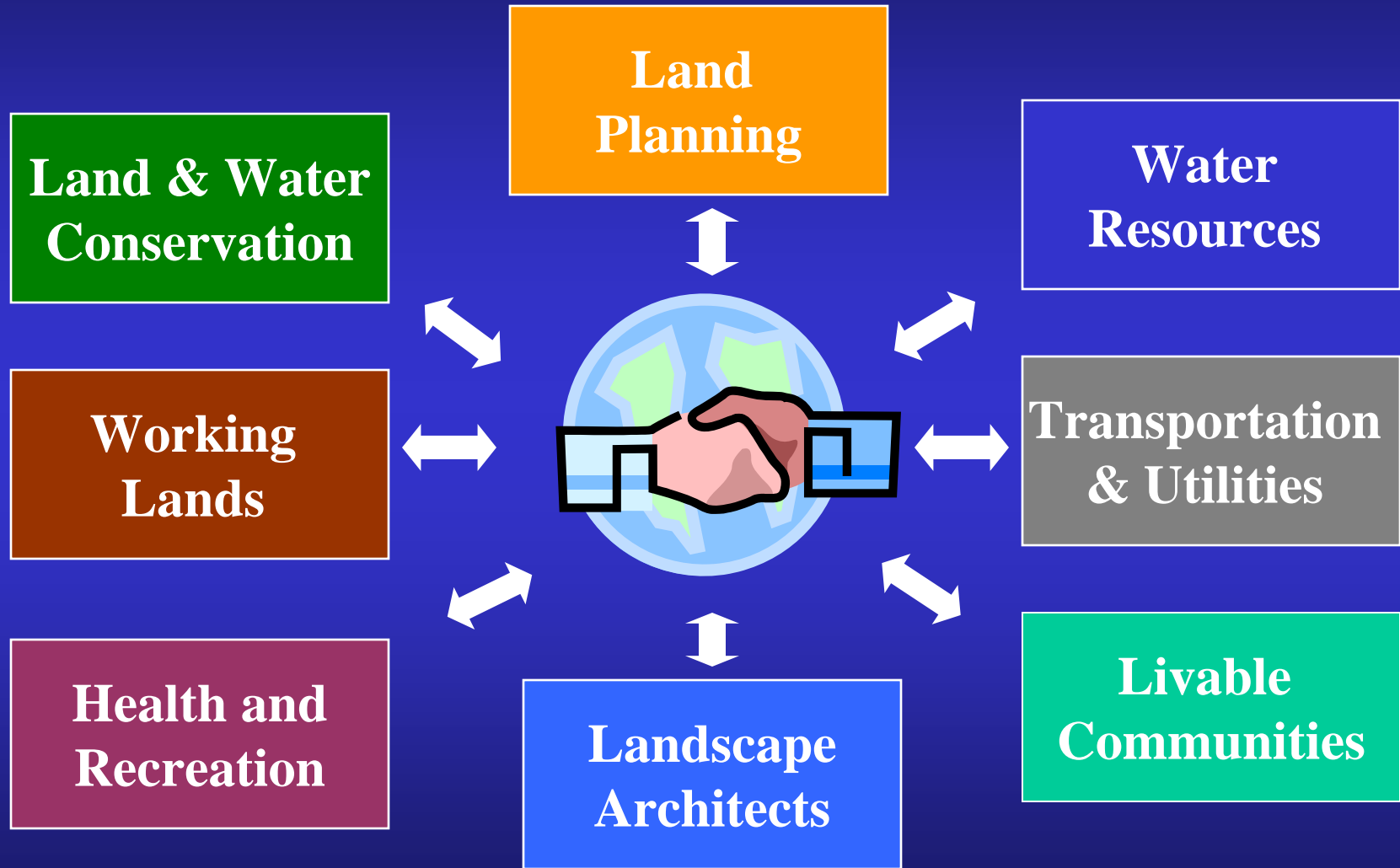
To Learn More
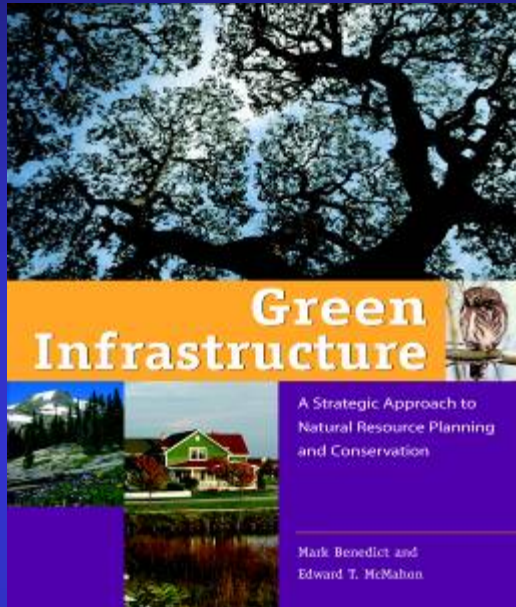
Read the New Book - Island Press, Spring 2006!

Take the Next Course - April 14 – 18, 2008; September 8 – 12, 2008

Visit the Website - www.greeninfrastructure.net